PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Assessing Adult Steelhead Escapement & Genetics In The South Fork Salmon

BPA project number: 20079
Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Nez Perce Tribe Department of Fisheries Resources Management

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

Name	Peter Cleary
Mailing Address	612 SW 2nd St.
City, ST Zip	Enterprise, OR. 97828
Phone	(541)426-5986
Fax	(541)426-2096
Email address	peterc@nezperce.org

NPPC Program Measure Number(s) which this project addresses
4.2a, 4.1

FWS/NMFS Biological Opinion Number(s) which this project addresses
ESA Section 10 Permit

Other planning document references
Wy-Kan-Ush-Mi Wa-Kish-Wit - 5d pages 1- 3

Short description
This project would document the current status, genetic profile, and life history characteristics of juvenile and adult steelhead in the South Fork Salmon River drainage. Results would be compared to the populations status as described by Thurow (1987).

Target species
steelhead trout

Section 2. Sorting and evaluation

Subbasin

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☐ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☒ Research & monitoring ☐ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9005500	Steelhead Supplementation Studies	Reciprocal transfer of data and PIT tagging coordination
9703000	Listed Stock Adult Escapement	Reciprocal transfer of data and PIT tagging coordination
8909802	Idaho Salmon Supplementation - NPT	Juvenile production/life history
9707300	Idaho Department of Fish and Game	Cooperative PIT tagging and SAR studies

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
2000	new project	

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Establish spawning ground index areas and summarize past data and studies.	a	Conduct literature search to document past efforts, identify past researchers, and obtain past data sets.
		b	Summarize past research literature and data in one document.
		c	Identify and verify the location of previous index areas.
2	Determine the natural spawning and life history of summer steelhead in selected streams in the South Fork Salmon River	a	Conduct weekly spawning ground surveys from February 1 to May 31 to determine the timing of spawning and locate carcasses and kelts.
		b	Explore the utility of non-lethal fish collection methods and collect kelts or carcasses as they emigrate from spawning areas.
		c	Estimate the proportion of hatchery steelhead in the spawning population whenever possible.
		d	Collect biological information of length, sex, scales, fin sample from kelts or carcasses to examine life history characteristic informations.
		e	Examine life history characteristics of spawning steelhead in streams.
3	Identify the present genetic character of steelhead in the South Fork Salmon River and compare the results to past analysis	a	Analyze allelic, polygenic and DNA data from juvenile and adult steelhead to characterize genetic profiles.
		b	Compare the electrophorectic results to previous analyses conducted in 1984-1986.

4	Assess the density and distribution of anadromous and resident species rearing in the South Fork Salmon River and tributaries.	a	Contact tribal, state and federal agencies to determine the locations of general parr monitoring and Idaho Salmon Supplementation snorkeling transects within the drainage.
		b	Locate snorkeling transects estabished by Thurow in 1984.
		c	Determine if present snorkeling transects can be utilized for this study.
		d	Establish and survey any transects needed to replicate past research efforts and accomplish this objective.
5	Prepare an annual report	a	Create apendix tables summarizing previous data sets and data collected in the year 2000.
		b	Prepare an annual report with recommendations regarding the feasibility of techniques and steelhead trout and resident fish population status.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/2000	4/2000		Summary of Literature and Data	5.00%
2	2/2000	5/2003	2a, 2b, 2c, 2d, 2e		35.00%
3	2/2000	10/2003	3a, 3b		10.00%
4	7/2000	8/2003	4d		25.00%
5	6/2000	12/2000			25.00%
				Total	100.00%

Schedule constraints
Unusually harsh winter storms may limit spring access to and visibility in streams. Storms and snow melt may wash out roads, create stream turbidity and hamper spawning ground counts. The completion of analysis of genetic samples may also delay reports.

Completion date
2003. - Three years will ensure results comparable to baseline data collected in 1984 and 1985.

Section 5. Budget

FY99 project budget (BPA obligated):

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Four FTE (project leader, biologist, Lead Technician and technician), two PTE (Fishery Aides)	%43	118,797
Fringe benefits	@ 27.0%	%12	32,075
Supplies, materials, non-expendable property	Dip nets, basket traps, axes, waders, snowshoes, office supplies and rent	%4	11,650
Operations & maintenance	Snowmobile repairs, GSA lease and repairs	%6	15,440
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Two 4x4 ATVs two laptop computers and one destop computer	%5	15,000
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags: 1000	%1	2,900
Travel	per diem, lodging, travel to Boise/Portland	%5	15,200
Indirect costs	@ 22.9%	%16	44,919
Subcontractor	independent genetic analysis	%8	22,500
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			$278,481

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
NPT	two snowmobiles and	%6	16,450

	tagging equipment		
		%0	
		%0	
		%0	
	Total project cost (including BPA portion)		$294,931

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$260,000	$267,800	$275,834	

Section 6. References

Watershed?	Reference
☐	Achord, Stephen et. al. 1995. Monitoring the Migrations of Wild Snake River Spring/Summer Chinook Salmon Smolts, Annual Report 1994. BPA report 91-028, contract DE-AI79-91BP18800, Portland, OR.
☐	Bendock, T. Alexandersdottir, M. 1993. Hooking Mortality of Chinook Salmon Released in the Kenai River, Alaska. North American Journal of Fisheries Management. Vol. 13. n 3..
☐	Columbia River Basin Fish and Wildlife Program. 1994. Northwest Power PlanningCouncil. Portland, OR.
☐	Hanson, J. and Lockhart 1998. Unpubished data.
☐	Hesse, J. 1997. A-run steelhead status in tributaries of the lower Clearwater River, Idaho. In Interactions of hatchery and wild steelhead in the Clearwater River of Idaho. 1995 Progress Report, Fisheries Stewardship Project, USFWS Report. November 1997.
☐	Kucera, P.A. and D.B. Johnson. 1986. A biological and physical inventory of the streams within the Nez Perce Reservation. BPA Report DOE/BP-10068-1.
☐	Schreck, C.B., H.W. Li, R.C. Hjort, and C.S. Sharpe. 1985. Stock identification of Columbia River chinook salmon and steelhead trout. Annual progress report submitted to Bonneville Power Administration. Sept. 21, 1985.
☐	Schwartzberg, M. 1987. Columbia upriver salmon stock identification reportBField operation guide. Tech. Rep 87-1. Columbia River -Inter Tribal Fish Commission, Portland, Oregon.

☐	Schill, D.J. 1996.Hooking Mortality of Bait-Caught Rainbow Trout in an Idaho Trout Stream and a Hatchery: Implications for Special-Regulation Management. North American Journal of Fisheries Management. Vol. 16. no. 2. pp. 348
☐	Snake River Recovery Plan. 1994. National Marine Fisheries Service. Seattle, WA.
☐	Thurow, R. 1987. Evaluation of the South Fork Salmon River Steelhead Trout Fishery Resoration Program.Completion Report, USFWS contract no. 14-16-0001-86505
☐	Thurow, R 1994. Underwater Methods for Study of Salmonids in the Intermountain West. General Techical Report INT-GRT-307. USFS, Intemountain Research Station, Ogdon, Utah
☐	
☐	Witty, K.L. 1995. A-run steelhead production in selected tributary streams of the lower Clearwater River Idaho. Ages 2-24 in Interactions of hatchery and wild steelhead in the Clearwater River of Idaho. 1994 Progress Report, Fisheries Stewardship Project,
☒	Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon). 1996. Columbia River Inter-tribal Fish Commission. Portland, OR.

PART II - NARRATIVE

Section 7. Abstract

Steelhead populations in the Salmon River subbasin are declining and are listed as a threatened species under the Endangered Species Act. The South Fork Salmon River (SFSR) stock is not an exception. A study was undertaken in 1984 by Idaho Department of Fish and Game to evaluate the status of wild steelhead trout and resident fish in the SFSR. They found a "viable wild population of steelhead trout" and estimated that there were 800 to 900 spawners in 1984 and 1985 (Thurow 1987).

The goal of this project is to determine the current status of steelhead trout spawning aggregates in the SFSR and compare the results to those of over a decade ago. Additionally, we hope to collect current genetic information to compare with the 23 enzyme system alleles that were isolated and analyzed in 1985 (Schreck et al. 1985, as cited in Thurow 1987). We also propose to characterize the genetic profile of South Fork Salmon River steelhead through DNA analysis of both juvenile and adult steelhead.

Present knowledge of natural adult steelhead escapement in the Snake River basin has been primarily limited to enumeration at Lower Granite Dam. In the SFSR aerial surveys

are conducted as trend counts by IDFG. There have been no attempts to verify aerial counts with ground counts (Nemeth – personal communication 12/98). Snorkeling surveys do continue in the subbasin by various agencies and programs but they do not provide life history information on returning adults.

This study will replicate the methods from the IDFG study (Thurow 1987) and compare the results. The study will take three years to complete. At termination we will be able to re-evaluate the status of steelhead in relation to the results of 1985.

Section 8. Project description

a. Technical and/or scientific background

Throughout the Clearwater River and Salmon River subbasin there is limited information to define the escapement of adult steelhead to individual spawning aggregates. Current attempts to monitor escapement utilize weirs on Fish Creek and Clear Creek in the Clearwater River subbasin, Rapid River in the Salmon River subbasin, and Little Sheep Creek in the Imnaha River subbasin. In the Salmon River subbasin limited aerial redd count surveys on the South Fork Salmon River, ground counts below the Sawtooth Weir, and some electrofishing in the Middle Fork and Upper Salmon River have been attempted but have not provided consistent results.

Similarly, there is little genetic profile information available to characterize steelhead spawming aggregates in the SFSR to understand how many (if any) unique conservation units may potentially exist. Studies conducted by the Nez Perce Tribe in 1983 and 1984 suggested that A-run populations in the lower tributaries of the Clearwater River were genetically unique (Kucera and Johnson 1986). Genetic variations among these fish were compared to other Snake River Basin steelhead populations (Milner and Teal 1986). The Nez Perce Tribe continued investigating populations of steelhead by cooperating in a study in 1995 and 1996 (Witty 1995 and Hesse 1997). Among the later projects, objectives were established to collect information on the genetic makeup of wild A-run steelhead and compare the results with Dworshak National Fish Hatchery B-run steelhead to determine if a detectable influence was occurring and evaluate potential adverse impacts of hatchery straying. The genetic information is currently being analyzed by NMFS. The study was unable to accurately assess adult straying utilizing a weir due to high water events.

Another study initiated in 1984 by IDFG evaluated the status of steelhead in the SFSR (Thurow 1987). The study notes that the SFSR historically supported steelhead trout runs of 3,000 fish and that the anadromous fishery had been closed since 1968. The methods used were multiple spawning ground counts, hook and line sampling of adults, snorkeling, and genetic analysis of steelhead parr.

The study found a population of 800 to 900 adult B-run steelhead. Differences in timing and escapement between years suggested that discrete spawning aggregates existed in

individual mainstem areas and tributaries. Electrophorectic analysis suggested that the SFSR drainage populations of wild steelhead are possibly isolated from Middle Fork Salmon River populations. Furthermore, the Johnson Creek and Secesh River spawning aggregates differed significantly at the PEP-GL enzyme system suggesting heterogeneity of the populations (Thurow 1987).

The Thurow (1987) study provided baseline information that lays the groundwork for future comparative studies in the SFSR drainage. It included a sampling program for future evaluation. While ground counts of steelhead redds may not be as accurate as weirs for enumerating adult returns, they do provide spawning timing and distribution information. All of the methods used for this study have been field-tested. We will duplicate all of these methods except for the sampling of adults with hook and line.

The only steelhead adults we will attempt to capture are spawned out kelts, or carcasses. Kelts will be sampled by traditional dip nets or basket traps. These are methods that pose no threat to the health of the fish and have been proven to work over thousands of years by tribal fisherman. Hook and line will not be used. Mortality occurring from this method average 7.6% for chinook salmon in the Kenai River, Alaska (Bendock 1993). Actively spawning fish will not be targeted for capture.

There is much uncertainty surrounding the population status of steelhead in the Clearwater and Salmon River subbasins. The NPPC Fish and Wildlife Program Measure 4.2a states that salmon and steelhead research under this program is expected to be designed to reduce scientific uncertainty and increase knowledge to achieve the salmon and steelhead goal and policies of this program. Additionally, the goals stated for Measure 4.1 is to halt the decline of salmon and steelhead by the year 2000 and double the salmon and steelhead runs without loss of biological diversity. Providing data relative to population status allows an ability to examine population trends over time.

This study will determine the status of steelhead in the SFSR drainage, provide genetic information and compare the results to baseline data collected 15 years ago. Fifteen years represent three generations of steelhead. The comparison of life history and enzyme system alleles between generations will provide management with a past and present profile of steelhead spawning aggregates in the South Fork Salmon River drainage.

b. Rationale and significance to Regional Programs

With the focus of regional programs being mainly on salmon, direct relationships to steelhead are not spelled out. Information is limited to monitoring various stream populations of juvenile steelhead through parr monitoring and smolt monitoring programs. However, various salmon recovery plans (including the 1994 FWP), and the Endangered Species Act all apply to responsible management of steelhead populations. All plans call for, request, or require an understanding of current population status and life history characteristics. This project will assess the current status of steelhead

spawning aggregates, genetic profile, and life history characteristics of steelhead within the SFSR drainage.

c. Relationships to other projects

This project will complement data on the status and life history data being collected on juvenile steelhead in the Secesh River system under the Idaho Salmon Supplementation project (8909802). This information, when combined with chinook salmon escapement data from the Secesh system collected under the Listed Stock Chinook Salmon Escapement Monitoring project (9703000), will provide a better understanding of anadromous fish in an unsupplemented drainage. The Idaho Department of Fish and Game project to monitor and evaluate natural production (9107300) is estimating smolt to adult survival of steelhead with a basin-wide approach utilizing PIT tags. Our project will help provide optional methods to monitor adult returns for that and other studies.

d. Project history (for ongoing projects)

This is a new project attempting to provide population status, genetic profile, and life history characteristic information from steelhead in the South Fork Salmon River. This information would document these variables and allow comparison to similar information collected by Thurow (1987).

e. Proposal objectives

Objective 1. **Establish index areas and summarize past data and studies.**
The purpose of this literature review is to provide management with a complete picture of the past studies in one document. The summary of literature will allow evaluation of previously collected information, assist in avoiding project obstacles, and ensure study replication that will allow comparison to past results.

Objective 2. Determine the distribution, timing and abundance of steelhead redds in the South Fork Salmon River drainage. Multiple ground counts will be conducted at the start of each week (task 2a) from February 1 to May 31. Each site will be walked every 4 to 7 days. The number of new redds, carcasses, and adults observed will be recorded for all transects. Live fish and carcasses will be observed for adipose fin clips. Proportions of natural and hatchery fish will be calculated from the total number of fish observed.

Kelts will be targeted for capture by dip net or basket traps after spawning is completed. Fishing sites will be chosen weekly and the number of hours fished will be recorded. Fishing sites will always be within spawning ground count transects and equal efforts will be given to each transect. Scales and fork lengths will be collected from captured fish. Scale analysis paired with fork length data will provide us with base line age/length information. Otoliths, scales, and fork lengths will be collected from recovered carcasses.

While our chances of recovering a steelhead carcass are slim due to the nomadic nature of kelts, collection and ageing of otoliths would confirm our scale analysis. Genetic samples will be collected in the same manner that the Idaho Salmon Supplementation studies collected genetic samples. A small portion of the right pelvic fin will be removed and preserved in an alcohol solution for later analysis. We will document any fin clips, jaw, radio, floy, or PIT tags. A remote chance exists of recovering a PIT or radio tag that would give an indication of survival, straying, migration timing, or age structure.

Objective 3. Identify the genetic character of South Fork Salmon River steelhead and compare to baseline information collected in 1984 and 1985. We will collect 50 steelhead parr from the SFSR, Lick Creek, the Secesh River and Johnson Creek. Minimum and maximum fork length will be 100 and 200mm. With the exception of the SFSR this duplicates the previous IDFG study. We will isolate the 23 enzyme system alleles as in the past study and compare individual enzyme systems. Electrophorectic and DNA analysis will be conducted on juvenile and adult samples. The subcontractor conducting the analysis uses mitochondrial DNA restriction fragment length polymorphisms (RFLPs), nuclear gene RFLPs of growth hormones and p53 gene introns, and microsatellite DNA using redesigned primers for PuPuPu and Om77. These three types of DNA cover the gamut of conserved and variable regions in both mitochondrial and nuclear DNA (Powell 1998). Collection of amples for genetic analysis will be coordinated with ongoing studies and with NMFS personnel to ensure analysis compatibility and avoid duplication of effort.

We will assume that the steelhead population is still sufficently robust, genetically viable and mating between pairs is still random. Therefore, we expect to find that there are no significant differences between the expected enzyme levels found in past analysis and observed levels found in the proposed sample. If a significant difference occurs then we will examine whether a population decline allowed random occurances, migration, or the mating/spawning of natural and hatchery fish could have affected enzyme system alleles.

Objective 4. Assess the density and distribution of anadromous and resident species rearing in the South Fork Salmon River and tributaries. We will locate the recommended transects in Appendix A of the 1987 IDFG report (Thurow 1987) and coordinate sampling with tribal, state, and federal agencies to avoid duplicating efforts. Transects that are not currently being surveyed will be snorkeled. Densites will be calculated from the resulting data.

We expect that juvenile steelhead densities will be lower than those observed in 1984 and 1985 for steelhead due to lower levels of escapement. Densities of resident fish will also be lower if habitat degradation is still affecting populations (Thurow 1987).

The information provided will help to evaluate if present populations of steelhead are decreasing or increasing.

Objective 5: Prepare an annual report. The annual report summarizing project results will be prepared to document the status and characteristics of steelhead in the SFSR. The report will contain appendicies summarizing appropriate literature and past and present results in table format.

The information will be disseminated in appropriate literature and presented at local AFS chapter meetings.

f. Methods

Study Area: The South Fork Salmon River drainage, hydrologic unit 17060208. The South Fork Salmon River drainage flows though the central Idaho Batholith and encompasses 1310 square miles. It contains 193 named streams. The elevations range from 2,740 to 640m. Mainstem reaches will range from the East Fork South Fork at Latitude Longitude ID (LLID) 1157131450148 to Warm Lake Creek at LLID 1156984446664. Tributaries will be limited to Buckhorn, Burntlog, Camp, Fitsum, Fourmile, Johnson, Tamarack, and Lick creeks and the East Fork South Fork and Secesh rivers.

Transects: A total of eleven transects covering 18.3-40 km will be surveyed on the mainstem of the SFSR. A total of eleven transects covering 44.6 km will be surveyed on the tributaries. All tributaries will have only one transect with the exception of the East Fork South Fork. It will have two.

Fishing Areas: Fishing areas will be located within transects. An equal amount of effort will be applied to each transect during the study. Gear will be limited to the following: dip nets, basket traps and seines. Barbless hook and line will not be used.

Hooking mortality studies for chinook salmon in Alaska's Kenai River ranged from 4.1% to 10.6%, with hooking mortalities highest for small males (Bendock 1993). Another study using bait-caught rainbow trout had an overall mortality rate of 46% (Schill 1996). Bendock states "Our estimates of mortality for chinok salmon are low". Schill questions his estimate because he maximized deep-hooking rates by encourgeing anglers to delay setting the hook. At any rate mortality estimates in this range are to high to justify using hook and line as a method.

The amount of effort for each technician/fisherman will be recorded in hours. This will enable us to compare the results of fishing to the tribal fishery on Rapid River and the past sports fishery on the SFSR. Both of these fisheries have had creel surveys conducted by the NPT and IDFG. Captured fish will be marked with a caudal punch to prevent duplication of data.

Methods for Objective One: This objective will be completed prior to data collection in the first year. The literature search will cover all written and accountable fisheries

management in the SFSR drainage. Contacts with other agencies will be made and past data sets should be obtained if possible. Past research will be categorized according to goals (eg. harvest rates, habitat evaluations) and data will be assembled in table format. Steelhead escapement index areas from the IDFG 1984 study will be physically located after the literature search.

The intent of the summarization of past literature is to lead the project biologist to past data sets. Knowledge of the presence or absence of specific data sets will help to channel data collection in the year 2000 to match past efforts. Collecting data that would represent a new baseline will not aid in re-evaluating steelhead in this drainage. If the possibility exists of collecting additional data, that allows a comparison to the past while conducting tasks associated with the objectives, then an attempt will be made to continue the effort.

Methods for Objective Two: Spawning ground surveys will be conducted once a week from February 1 to May 31 in the 22 previously identified transects. The intensity of the counts will be increased to every five days from April 20 to May 20 as recommended (Thurow 1987). A multiple ground count censuses have been used to delineate when peak chinook salmon spawning occurred and when spawning was completed (Schwartzberg 1987). Weekly redd counts will increase redd count accuracy, provide spawning timing, and maximize adult carcass collections. Number of new redds, number of live fish, and carcasses will be recorded while walking up/down or floating (cataraft) down the stream, in the respective survey transects. The multiple ground census will aid in redd identification especially where multiple redds occurred or when high runoff/rainstorm events caused heavy siltation of redds. Redds will be marked with flagging that records the date observed and an identification number. Different colored flagging will be used during each survey period. Marking redd locations with flags and recording notes on each redd will be beneficial in areas where multiple redds occurred and in identifying individual redds for redd visibility observations. A conservative count will be made in areas when multiple redds are present.

It is unlikely that we will recover enough steelhead carcasses to make a statement of the life history characteristics. Therefore, weekly non-lethal fishing efforts will target kelts (spawned out steelhead). Fishing will be conducted as previously stated. Kelts will be identified as steelhead dark in color and displaying lethargic behavior. Visual identification will be made prior to an attempt to capture the adult. Adults captured during objective one tasks will be handled with care and sampled the same as kelts. Special care will be given to avoid harassing actively spawning steelhead.

Steelhead carcasses and kelts will be examined for any marks/tags and measured to the nearest 0.5 cm in mid-eye hypural plate length and fork length. The mid-eye hypural length is recorded because it provides a more accurate measurement than fork length due to the decomposition and degeneration of the caudal fin. Scales will be removed from carcasses when available and placed in labeled coin envelopes for aging and scale pattern analysis. Scales are removed from the key area located two to three rows above the lateral line on a diagonal scale column running from the posterior base of the dorsal fin to the

anterior base of the anal fin (Schwartzberg 1987). Portions of ventral/pectoral fins will be collected for genetic analysis. Carcasses will be opened up to determine the sex of the fish and stage of spawning (i.e. - % spent) and the tails cut off to prevent duplicate sampling. Captured fish will be marked with a caudal fin punch each time they are captured. The caudal punch may also be used for genetic sampling.

The critical assumption is that recovered carcasses and captured fish will be representative of the returning population. If environmental conditions hamper our efforts this assumption may be violated. However, the resulting information will still increase our present knowledge of the spawning aggregate.

We expect to be able to determine the timing and distribution of steelhead spawning in the SFSR drainage. Data collected from carcasses and kelts will provide age/length, sex ratio, and genetic information that will help to evaluate the current status of the spawning aggregate. The resulting redds per kilometer will allow a comparison to past evaluations.

Methods for Objective 3: We will collect four groups of 50 steelhead parr, ranging in fork length of 100 to 200mm, from the Secesh River, Johnson Creek, Lick Creek and the main SFSR (located upstream of the IDFG weir) for electrophoretic and DNA analysis. A similar number of adult steelhead per stream will be collected (if possible) for both types of genetic profile analysis. Fork length, weight, location and date of capture will be recorded. Each specimen will be assigned a sample identification. Specimens will be packed in ice and frozen flat within 2 hours (electrophoretic analysis) and preserved on site in labeled specimen containers (DNA analysis). A contractor will perform the electrophoretic and DNA analysis.

Electrophoretic will be used to analyze individual enzyme system alleles. Observed values will be compared to values observed in by calculating chi-square values. Confidence level will be calculated at the 95% level. The Secesh River and Johnson Creek will be compared in the same manor. Subcontractor conducting the DNA analysis uses mitochondrial DNA restriction fragment length polymorphisms (RFLPs), nuclear gene RFLPs of growth hormones and p53 gene introns, and microsatellite DNA using redesigned primers for PuPuPu and Om 77. These three types of DNA coveer the gamut of conserved and variable regions in both mitochondrial and nuclear DNA (Powell 1998).

The tributaries were chosen for this objective based on past analysis (Thurow 1985). The SFSR mainstem was added to give a better representation of the drainage and allow a comparison to the chosen tributaries and possibly the genetic information collected from adults. Comparisons to past enzyme system alleles will be limited to the Secesh River and Johnson Creek. Sample size was determined after consulting with IDFG (Nemeth – personal communication 12/98). The sample size is identical to a proposed genetic study of steelhead in the Middle Fork Salmon River.

The comparison of enzyme system alleles will help us to determine if any change has taken place in the population. Significant differences in individual enzyme system alleles

may suggest that the population undergone genetic change. Several possibilities could explain why such a change might have taken place. We will hire and consult with a geneticist for a quantitative analysis.

Methods for Objective 4: We will locate snorkeling transects identified in Appendix A, (Thurow 1987). Coordination with state and federal agencies will prevent duplication of effort within the subbasin. Transects will be viewed from the bank prior to data collection to ensure they are still representative of good juvenile rearing habitat. Methods for snorkeling will follow the methods previously established (Thurow 1984, 1987).

All species will be noted in their habitat and estimated to the nearest inch. Habitat will be classified as pool, run, riffle, or pocket water. Multiple habitat types may occur in transects. Observed fish will be reported as fish per $100m^2$ and compared too earlier results by calculating chi-square values.

The resulting information will help us to evaluate if the present population of steelhead and resident fish are decreasing or increasing.

g. Facilities and equipment

This project to would be operated out the Nez Perce Tribes McCall field office. Current facilities are adequate to support the additional employees for administrative and technical preparation work. This projects would utilize snowmobiles and trailers in the office. This equipment is associated with ongoing research but not fully utilized during the spring. Tagging equipment (eg. scanners, computers) will be barrowed from the ISS studies.

This project will also utilize the facilities at Burgdorf Hot Springs, Warm Lake and Wapetti Lodge. These are private resorts located along Lake Creek (tributary to the Secesh River), SFSR, and Johnson Creek. Lodging will be nessisary to conduct redd counts in an efficient manor.

h. Budget

The proposed study uses a labor intensive methods (eg. redd counts). Therefore, personnel costs account for a high proportion of the total proposed budget. The project will fund 4 full time employees and 2 seasonal aides: Project leader, NPT range 14 step 1 @ $16.46/hour; Project biologist, NPT range 12 step 2 @ $14.00/hour; Lead fisheries technician, NPT range 10 step 1 @ $11.24/hour, Fisheries technician, NPT range 9 step 1 @ $10.22/hour; Fisheries aide, NPT range 7 step 1 @ $8.44/hour for 8 pay periods.

Proposed supplies expenditures are not expected to exceed $11,650. Because of the diverse nature of the field work and the conditions expected, equipment including wet suits, neoprene waders, expedition quality winter clothing, and snow shoes will be supplied to all field personnel. In addition dip nets, spawning ground survey equipment, and a GPS (Global Positioning System) will be acquired.

Office supplies and rent at the NPT McCall field office will be paid from this supply line item. Operations and Maintenance costs will cover transportation and maintenance expenses of project vehicles. O&M funds will include rental and repair costs for the project's use of 2 NPT owned snowmobiles, and rent and mileage costs for 2 GSA vehicles.

Capital Acquisitions include only the purchase of 2 4x4 all terrain vehicles. Field locations will not be accessible during the spring and fall without alternative transportation. Equipment and personnel will need to be transported through unmaintained and/or non-roaded areas. PIT-tagging equipment and supplies will borrowed from regional NPT projects (Idaho Supplementation Studies).

Travel costs cover 80 days of project related travel for 4 people at the federal per diem rate of $35/day. We anticipate coordination meetings in Boise, Portland, and Seattle, and presentations at regional conferences to account for an additional $4,000 in related travel expenses.

Analysis of genetic tissue samples will be accomplished through an independent subcontractor. We expect to process approximately 150 juvenile steelhead tissue samples with an estimated fee of $150/ sample.

Section 9. Key personnel

Program Director:	Paul Kucera**,** no project funding**,** Provides technical direction and coordination with administration of program
Research Coordinator:	Jay Hesse, no project funding provided, Coordinates LSRCP studies with Imnaha Smolt Monitoring and provides technical direction
Project Leader:	Peter Cleary (until the position is filled), 1 FTE, will provide supervision, enforce permits, and perform data analysis
Fisheries Biologist:	Vacant, 1 FTE ,will supervise daily field activities, report weekly to the Project Biologist, assist with trapping duties, and perform data summary
Lead Fisheries Technicians:	Vacant, 1 FTE, will assist Fisheries Biologist in the field and office
Technician:	Vacant, 1 FTE, will perform field work pertainent to the project
Seasonal Aides:	Vacant, .3 FTE, will assist with data collection

Peter Cleary, Project Leader

Work Address: Nez Perce Tribe Dept. of Fisheries Resource Management

612 2nd Street
Enterprise, Oregon 97828
(541) 426-5986

Experience

1998 to present	Project Leader with the Nez Perce Tribe Department of Fisheries Resources Management. Responsible for the Imnaha Smolt Monitoring Program.
1997 to 1998	Fisheries Biologist with the Nez Perce Tribe Department of Fisheries Resources Management. Responsible for conducting research for the Idaho Salmon Supplementation Studies.
1997 to 1994	Lead Fisheries Technician with the Nez Perce Tribe Department of Fisheries Resource Management. Conducted research and coordinated field activities for the Idaho Salmon Supplementation Studies.
1994	Experimental Biological Aide for Oregon Department of Fish and Wildlife. Responsible for conducting a steelhead creel survey along the Wallowa River.
1994 to 1993	Biological Aide for Idaho Department of Fish and Game, McCall Hatchery. Tended to chinook salmon, egg to smolt, and spawned adults.
1993	Volunteer Work for Frank Frost, Graduate Student, University of Idaho. Assisted with a juvenile trap and adult weir for kokanee.

Education

1992	Bachelor of Science Oregon State University Major: Zoology

Publications

Hesse, J.A., P.J. Cleary, and B.D. Arnsberg. 1995. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1993. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Paul Kucera is the program leader for the Assessing Adult Steelhead Escapement and Genetics in the South Fork Salmon River project. Mr. Kucera has 23 years professional experience as a Fisheries Biologist in research, management, and administration and is Certified Fisheries Scientist through AFS. He has authored or co-authored seven peer-

reviewed fisheries journal publications and over 40 project reports. Responsible for technical program direction and administration of the Fisheries Research Division.

Education:	Bachelor of Science, 1975	Utah State University
	Major: Fisheries Management	
	Graduate Studies, 1984-1987	University of Idaho
	Major: Fisheries Management	

Jay Hesse is the Research Coordinator for the Assessing Adult Steelhead Escapement and Genetics in the South Fork Salmon River project. Mr. Hesse has five years professional experience as the Research Coordinator and as a Fisheries Research Biologist. Responsible for technical direction and supervision of all research division projects, research coordination, and tribal fisheries research representation at state and federal meetings.

Education:	Bachelor of Science, 1992	Michigan State University
	Major: Fisheries and Wildlife	
	Masters of Science, 1994	Michigan State University
	Major: Fisheries	

Section 10. Information/technology transfer

Annual reports will be submitted for publication as BPA documents. Regional transfer of the applicability of methods utilized will be accomplished through presentations at Idaho chapter of AFS and at regular Nez Perce Tribe/ODFW/IDFG coordination meetings.

Congratulations!